REMARKS

Claims 1-28 are pending in this application. Claims 1-28 stand rejected. Claims 1, 3, 8, 12, 15, 17, 21-25, and 27 have been amended. Claims 1-28 remain in the application. Applicants respectfully traverse the rejections for the reasons expressed herein below.

A. Objections to the Specification

The Examiner objected to the specification because of various informalities. In this regard, the specification has been amended as requested by the Examiner.

In particular, the paragraph on page 5, lines 10-19, has been amended such that the method of forming a ferrite material of the present invention includes the act of heat treating the major and minor components to form the ferrite material. Support for this amendment is set forth throughout the specification, including on page 11, lines 17-19, and in the Examples.

Also, the lower range of the MnO component of one embodiment of the present invention has been amended at page 8, lines 26-27, from 37.0 to 38.0 in order to conform this range to the broader range discussed in the specification. Support for this amendment can also be found throughout the specification, including on page 8, lines 3-5.

Accordingly, withdrawal of the Examiner's objections to the specification is respectfully requested.

B. Objection to the Claim

As noted by the Examiner, claim 24 has been amended to correct an obvious typographical error (the "7" preceding the "a" has been deleted). Withdrawal of this objection to the claim is respectfully requested.

C. Rejection of Claims 12-18, 21, and 25 under 35 U.S.C. §112, First Paragraph

Claims 12-18, 21, and 25 stand rejected under 35 U.S.C. §112, first paragraph, as being non-enabling for a sintered material comprising any ferrite having the claimed power loss. In this regard, the Examiner states:

> There is no guidance or teaching in the specification or art to enable one of ordinary skill in the art to choose a ferrite composition and process conditions, such as time, temperature and atmosphere, from the thousands of possible choices compositions and conditions, so as to produce the claimed material...Accordingly, it would require undue experimentation in order to determine what ferrite comprising material have the claimed properties, besides that taught in the specification.

For consistency with the specification, the claims have been amended to recite that the ferrite material is a zinc-manganese ferrite material. Otherwise, Applicants respectfully disagree with the Examiner and assert that claims 12-18, 21, and 25, in view of the specification, are enabled for a sintered material comprising a manganese-zinc ferrite having the claimed power loss at the recited conditions, and that the specification does enable one of skill in the art to make the invention commensurate in scope with the claims 12-18, 21, and 25.

As set forth in MPEP § 2164.08, while the specification must teach those skilled in the art how to make and use the full scope of the invention, not everything necessary to practice the invention need be disclosed. The scope of enablement must only bear a reasonable correlation to the scope of the claims, such that the claims are given their broadest interpretation that is consistent with the specification. It is well known that one does not look to the claims but to the specification to determine enablement. As set forth in the *In re Goffe*, 542 F.2d 564, 567, 191 USPQ 429, 431 (CCPA 1976):

> To demand that the first to disclose shall limit his claims to what he has found will work or to materials which meet specified for "preferred" materials in the process such as the one herein involved would not serve the constitutional purpose of promoting progress of the useful arts.

Applicants have provided over two dozen working and comparative examples that provide support for claims 12-18, 21, and 25. Throughout the specification, the Applicants have provided ample guidance and great detail on the characteristics and properties of the starting materials and the resultant ferrite material that provide the particular properties recited in claims 12-18, 21, and 25. These characteristics include the particular major and minor components employed (and not employed) and their amounts, processing conditions, such as particle size ranges, additives employed, sintering conditions used, pressed densities, and the resultant properties of the sintered product, such as power loss, flux density, and Curie temperature. As set forth on page 17, lines 18-19, the Applicants state that prior art techniques have not been successful in meeting this combination of performance criteria.

It is respectfully submitted that the Applicants need not limit their claims to the specific compositions that have been found to work, or to the specified materials disclosed, as requested by the Examiner. Such a limitation is not required by MPEP § 2164.08.

Accordingly, in view of the amendment to the claims and the arguments set forth above, withdrawal of the rejection to claims 12-18, 21, and 25 under 35 U.S.C. §112, first paragraph, as being non-enabling is respectfully requested.

D. Rejection to the Claims under 35 U.S.C. §112, Second Paragraph

The Examiner has rejected claims 3, 8, 14, 21, and 27 as be indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicants regard as the invention, and has identified certain areas that require specific correction.

In this regard, claim 3 has been amended to recite a range commensurate in scope with the broad range from which this claim depends. Support for this amendment can be found throughout the specification, including on page 8, lines 3-5.

Claim 8 has been amended to clarify that it is the particle size of the raw materials of the components that are within the claimed particle size range. Applicants have amended the dependency of this claim from claim 1 to claim 27 to further limit claim 27.

The Examiner has indicated that claims 14 and 21 are substantial duplicates. Applicants respectfully disagree that claims 14 and 21 are substantial duplicates. Claim 14 is dependent from claim 13. Claim 13 recites that the power loss of the sintered material ranges from 85 mW/cm^3 to 130 mW/ cm^3. Claim 14 recites that the power loss is below 100 mW/ cm^3. Accordingly, the power loss recited in claim 14, in essence, ranges from 85 mW/cm^3 to below 100 mW/ cm^3. In contrast, claim 21 recites a power loss range of below 100 mW/cm^3, without any specified minimum value. Accordingly, it is asserted that claims 14 and 21 are not substantial duplicates, and that their difference is not a mere difference in wording.

Claim 27 has been amended to recite that the major and minor components are heat treated to form the ferrite material.

In view of the amendments and discussion set forth above, withdrawal of the rejections to claims 3, 8, 14, 21, and 27 under 35 U.S.C. §112, second paragraph, is respectfully requested.

E. Claim Rejections under 35 U.S.C. §102

1. Claim Rejections under 35 U.S.C. §102(e)

Claims 22-24 stand rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Application No. 2002/36472 to Kurachi et al. ("Kurachi"). The Examiner draws the Applicants' attention to specific areas of Kurachi that are said to teach the present invention as recited in the claims. Applicants respectfully traverse this rejection and requests reconsideration of claims 22-24, as amended.

As amended, independent claims 22-24 recite a sintered manganese-zinc ferrite material that attains a Curie temperature above 280°C in the absence of nickel. As disclosed in the specification starting on page 15, line 13, embodiments of the sintered ferrite material of the present invention exhibit properties that include high Curie temperature above 280°C. As set forth throughout the specification, these high Curie temperatures are achieved through the addition of various major and minor components, none of which requires the addition of nickel. Nickel need not be included in the composition of the present invention. Indeed, as disclosed in Table 1, the amount of nickel, if any, that is included in embodiments of the ferrite materials of the present invention need not be above trace/impurity levels. Claims 23 and 24 have been amended to recite the percentages of minor components in the present invention.

Kurachi discloses a Mn-Zn polycrystalline ferrite that has a Curie temperature of 270°C or more. Kurachi discloses at page 3, paragraph 48 and Figs. 3 and 4 that the Curie temperature of 270°C or more is attained based on the application of two concepts: 1) increasing the iron content to 72 wt% or more; and 2) adding nickel to the ferrite material. As set forth in Kurachi page 5, paragraph 58, and in Fig. 3, the Curie temperature of "roughly" 270°C could be attained with a Mn-Zn ferrite composed of only Fe_2O_3, MnO, and ZnO as the raw materials of the ferrite. However, as discussed by Kurachi on page 5, paragraph 60, and as set forth in Fig. 4, it is only through the addition of nickel, (NiO) that the Mn-Zn ferrite is able to attain a Curie temperature of 270°C or more.

It is axiomatic that prior art is anticipatory only if every element of the claimed invention is disclosed in a single item of prior art in the same form as arranged in the claim. More specifically, anticipation is established only when a single prior art reference discloses, expressly or under principles of inherency, each and every element of a claimed

invention. MPEP §2131 (emphasis added). Such disclosure must also be shown in as complete of detail as is contained in the patent claim. MPEP §2131.

Even in its broadest form, amended claims 22-24 of the present application recite a sintered manganese-zinc ferrite material having a Curie temperature above 280°C in the absence of nickel. It is asserted that Kurachi does not disclose a sintered manganese-zinc ferrite having a Curie temperature above 280°C in the absence of nickel, as recited in claims 22-24 of the present invention.

Thus, based on this fact and the principles outlines above, Applicants submit that Kurachi does not anticipate claims 22-24 of the present invention, and that any rejection of 35 U.S.C. §.102(e) cannot stand. Withdrawal of the rejection under 35 U.S.C.§102(e) over this reference is respectfully requested.

In addition, the teachings of Kurachi do not render obvious claims 22-24 of the present invention. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. MPEP §2143.03. While a prima facie finding of obviousness necessarily includes the combining of prior art teachings, various prior art teachings are not properly combined unless there is something in the prior art itself that suggests that those teachings could or should be combined. MPEP §2143.01. Put another way, the mere fact that prior art teachings can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination or modification. MPEP §2143.01. In addition, it must be remembered that a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. MPEP §2141.02.

As discussed above, Kurachi discloses on page 5, paragraph 60, and in Fig. 4, that it is through the addition of nickel, (NiO) that the Mn-Zn ferrite is able to attain a Curie temperature of 270°C or more. There is no suggestion or motivation in Kurachi to form a

Mn-Zn ferrite within the claimed Curie temperature in the absence of nickel, to arrive at the advantages obtained from the present invention.

Accordingly, Kurachi cannot be said to render obvious claims 22-24 of the present invention.

2. Claim Rejections under 35 U.S.C. §102(b)

Claims 22-24 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No.2,886,529 to Guillaud ("Guillaud"). The Examiner draws the Applicants' attention to specific areas of Guillaud that are said to teach the present invention as recited in the claims. Applicants respectfully traverse this rejection and request reconsideration of claims 22-24, as amended.

As amended, independent claim 22, and the claims that depend therefrom, recite a sintered manganese-zinc ferrite material having a Curie temperature above 280°C having minor components in amounts totaling at least 0.055 weight percent (this total being a simple addition of the lowest disclosed range amounts of the minor components). As discussed above, the sintered ferrite material of the present invention includes properties that include high Curie temperatures that are achieved through the addition of various major and minor components, the minor components being present in an amount of at least 0.055 percent by weight. Claims 23 and 24 have been amended to recite the percentages of specific minor components in the present invention.

Guillaud discloses at column 1, lines 45-50, a Mn-Zn ferrite that is characterized by the formula: (mFe2O3, xMnO, yFeO, qZnO) in which m, x, y, and q represent the molecular percentages of the components ($m + x + y + q = 100\%$). As set forth in column 2, lines 35-41 Guillaud further states:

> Further, it has been found that ferrites having the best possible magnetic properties according to the present invention can only be obtained subject to the condition that the oxide mixture from which they are prepared contain less than 0.05% in weight of impurities...
> (emphasis added)

Even in its broadest form, amended claims 22-24 of the present application recite a sintered manganese-zinc ferrite material having intentionally added minor components that are present in an amount of at least 0.055% by weight. It is asserted that no minor components are desired in the Guillaud compositions, and that any components other than iron, manganese, and zinc are unintentional impurities. Guillaud does not disclose the sintered manganese-zinc ferrite as recited in claims 22-24 of the present invention, as amended.

Thus, based on this fact and the principles outlines above, Applicants submit that Guillaud does not anticipate claims 22-24 of the present invention, and that any rejection of 35 U.S.C. § 102(b) cannot stand. Withdrawal of the rejection under 35 U.S.C.§102(b) over this reference is respectfully requested.

In addition, the teachings of Guillaud do not render obvious claims 22-24 of the present invention. As discussed above, Guillaud discloses that the ferrite material only include iron, manganese, and zinc components, with all other components being in the form of impurities that total less than 0.05 percent by weight. Indeed, Guillaud teaches away from intentionally adding any material other than iron, manganese, and zinc components. All other components employed in Guillaud are substantially less than those recited in the present invention, and are clearly not intentionally added as minor components totaling at least 0.055% by weight, as recited in the claims of the present invention.

Accordingly, Guillaud cannot be said to render obvious claims 22-24 of the present invention.

F. Rejection of Claims under 35 U.S.C. § 103(a)

1. Rejection of claims 17 and 18 under 35 U.S.C. § 103(a)

Claims 17 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over United States Patent No. 5,871,662, issued to Van Der Zaag et al. ("Van Der Zaag"). Applicants respectfully traverse this rejection and requests reconsideration of claims 17 and 18, as amended.

Claims 17 and 18, as amended, recite a sintered material comprised of a manganese-zinc ferrite material and having a power loss of below 300 mW/cm^3 at a frequency of 3.0 MHz and a magnetic flux density of 100 G at a temperature range between 80°C and 140°C.

Van Der Zaag discloses a sintered transformer or inductor core of a Ni-Zn ferrite material that is said to exhibit relatively low overall losses when it is used in a power transformer. As set forth in column 4, starting at line 9, the compositions of the sintered material of Van Der Zaag is given by the formula $Ni_{0.49}Zn_{0.49}Co_{0.02}Fe_{1.90}O_{3.85}$. NiO, ZnO Fe_2O_3 and Co_3O_4 are mixed in a proportion as set forth in the formula, presintered, milled, dried and compacted into a transformer core.

It is respectfully submitted that as a result of the amendment to claims 17 and 18, the rejection of these claims based on the disclosure of Van Der Zaag is now moot. As discussed above, claim 17 and 18, as amended, more specifically recites that the ferrite material of the recited claims is a manganese-zinc ferrite material. Clearly, Van Der Zaag is directed to a nickel-zinc ferrite material, not a manganese-zinc ferrite material, as recited in claims 17 and 18. Van Der Zaag does not teach or suggest a manganese-zinc ferrite material.

Accordingly, in view of the amendments made to the claims and the supporting arguments set forth above, withdrawal of the rejection to claims 17 and 18 under 35 U.S.C. § 103(a) over Van Der Zaag is respectfully requested.

2. Rejection of Claims 1-7, 9-11, 19, 20, 22-24, and 26-28 under 35 U.S.C. § 103(a)

Claims 1-7, 9-11, 19, 20, 22-24, and 26-28 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 6-325920 ("the Japanese Abstract"). Applicants respectfully traverse this rejection and requests reconsideration of claims 1-7, 9-11, 19, 20, 22-24, and 26-28.

Claims 1-7, 9-11, 19, 20, and 26-28, in their broadest sense, recite a ferrite material (or method of forming a ferrite material) comprising as main components, an iron oxide ranging from 55.5 to 58.0 mole percent calculated as Fe_2O_3, an amount of manganese oxide ranging from 38.0 to 41.0 mole percent calculated as MnO, and an amount of zinc oxide ranging from 3.3 to 4.7 mole percent calculated as ZnO, and as minor components, an amount of calcium oxide ranging from 0.030 to 0.100 weight percent calculated as CaO, an amount of silicon oxide ranging from 0.015 to 0.040 weight percent calculated as SiO_2, and an amount of niobium oxide ranging from 0.010 to 0.030 weight percent calculated as Nb_2O_5.

As noted by the Examiner, the Japanese Abstract teaches a spinal type Mn-Zn ferrite that contains 30 to 42 mole percent of MnO, 4 to 19 mole percent of ZnO, with the remainder (39-66 mole percent) of Fe_2O_3 as the main components, and contains less than 1 weight percent CaO, less than 1 weight percent SiO_2, and less than 0.8 weight percent of Nb_2O_5 as subcomponents.

It is respectfully submitted that the Japanese Abstract cannot form the basis of a rejection under 35 U.S.C. § 103(a) to reject claims 1-7, 9-11, 19, 20, 22-24, and 26-28. This is so because the Japanese Abstract discloses such a broad range of amounts of the components and subcomponents that one of skill in the art reading the Japanese Abstract would not recognize the criticality of the claimed ranges of the present invention, and the advantages of the claimed composition, without undue experimentation. MPEP § 2144.05.

As set forth on page 11, beginning at line 22 of the present specification, and as illustrated in the Examples and Tables 1 and 2, it has been found that the Mn-Zn ferrite materials that combine components of iron, such as Fe_2O_3, manganese, such as MnO, and zinc, such as ZnO, as major components, and components of silicon, such as SiO_2, calcium, such as CaO, and niobium, such as Nb_2O_5, as minor components, in the particular amounts discussed above, provide improved properties relative to known ferrite materials. As discussed throughout the specification, the compositions of the present invention have relatively low ZnO content, a high Fe_2O_3 content compared to typical Mn-Zn ferrites, and further combine amounts of SiO_2, low CaO content and Nb_2O_5 to control and limit power losses. It has been found that the combination of these components result in a material having improved ferrite properties.

As set forth in Table 1 on page 13 of the present disclosure and the discussion that follows, Lots 1-19 that represent compositions of the present invention disclose particular amounts of major and minor components that provide improved properties to a sintered ferrite material. However, when there is a variation of these amounts, the superior properties of the ferrite material are not realized. In some instances, only a relatively slight variation outside the claimed amounts may adversely affect the properties of the ferrite material. For example, as set forth in the specification at page 15 lines 9-12, Lot No. 25 is provided as a comparative example, and illustrates the poor results obtained when a

composition having component amounts (in this case 0.06 wt % SiO_2) outside of the claimed ranges, but inside the ranges disclosed by the Japanese Abstract, are prepared and tested.

Accordingly, it is submitted that the Japanese Abstract discloses such wide ranges outside the claimed ranges of the present invention, that one of skill in the art reading the Japanese Abstract would have not direction or motivation to focus on the particular critical claimed ranges of the present invention. One of skill in the art reading the Japanese Abstract would have no appreciation of the criticality of the claimed ranges of the present invention as recited in claims 1-7, 9-11, 19, 20, and 26-28, and could only arrive at the advantages obtained by the present invention, if at all, by undue experimentation. Also, as a result, it is submitted that one of skill in the art would not expect the ferrite materials disclosed in the Japanese Abstract to have the particular recited Curie temperature ranges recited in claims 22-24.

Accordingly, for at least the reasons discussed above, withdrawal of the rejection to claim 1-7, 9-11, 19, 20, 22-24, and 26-28 under 35 U.S.C. § 103(a) over the Japanese Abstract is respectfully requested.

CONCLUSION

Applicants submit that claims 1-28 of the present invention, as amended, recite a novel and non-obvious ferrite material, and method of forming the same. The cited references do not teach or suggest the claimed invention. In view of the foregoing, Applicants respectfully submit that the subject application is in condition for allowance. Accordingly, reconsideration of the objections and rejections, and allowance of the claims at an early date are earnestly solicited.

If the undersigned can be of assistance to the examiner in addressing issues to advance the application to allowance, please contact the undersigned at the number set forth below.

Respectfully submitted,

7/25/03
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